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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	BEN FREDJ et. al	Atty Dkt.:	1200.474
Application No:	09/803,735	Examiner:	FORD
Filed:	March 12, 2001	Group Art Unit:	3743

Title: VEHICLE AIR CONDITIONING DEVICE INCLUDING A MULTIPURPOSE HEAT EXCHANGER

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APPLICANT'S BRIEF UNDER 37 CFR § 1.192

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Washington, D.C. 20231

Dear Sir:

In follow-up to the Notice of Appeal filed September 30, 2003, Appellant respectfully request the Board of Patent Appeals and Interferences consider the following arguments and reverse the decision of the Examiner in whole.

(1) REAL PARTY IN INTEREST

The real party in interest is Valeo Securite Habitacle, assignee to the instant invention.

(2) RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal.

(3) STATUS OF THE CLAIMS

1. Claims 1-17 were filed with the original application on March 12, 2001.

2. On April 24, 2001 the United States Patent and Trademark Office (USPTO) granted the original filing date but sent the Applicant a Notice of Missing Parts.

3. On June 19, 2001, the Applicant provided the missing declaration, power of attorney, assignment, and priority document.

4. On March 27, 2002, the Examiner issued a restriction indicating that at least 14 different species were present and disclosed in Figures 1-14. The Examiner also indicated that an additional indeterminant number of species were present because on page 14, lines 24-27 the specification indicated that the heat-carrying fluid circuits disclosed in Figures 1-6, 13 and 14 can be associated with each of the refrigerant-fluid circuits of Figures 1-6, and 12-14.

5. On April 26, 2002, the Applicant elected Species IV directed to the embodiment of Figure 4. The Applicant indicated that claims 1-5 and 8-15 were readable on the elected species, and claim 1 was generic. Claim 1 was also amended and new claims 18-20 were added.

6. On July 2, 2002, the Examiner indicated that claims 10, 12 and 13 were not readable on the elected species. The Examiner also withdrew claims 18-20. Claims 1-5, 8, 9, and 11 were rejected under 35 U.S.C. 103(a) as being unpataentable over the combined teachings of JP 60148716 and DE 3820811. The Examiner also rejected claims 1-5, 8, 9, and 11 under 35 U.S.C. 102(b) as anticipated by JP 54-104636, or JP 6-207763, or JP 10-311615, or JP 58-183812 or U.S. Patent 2,328,472 to Lehane et. al. In the alternative, the Examiner rejected claims 1-5, 8, 9, and 11 under 35 U.S.C. 103(a) as obvious in view of JP 54-104636, or JP 6-207763, or JP 10-311615, or JP 58-183812 or U.S. Patent 2,328,472 to Lehane et. al. Claims 14 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over any of the prior art as applied to claim 1 and further in view of JP 59-143716 and EP-A-964218.

7. On January 2, 2003, the Applicant traversed the rejection and amended claims 1 and 18 to further define the invention over the prior art.

8. On March 31, 2003, the Examiner issued a Final Rejection rejecting claims 1-5, 8, 9, 11, 14, and 15. The Examiner rejected claims 1-4, 11, 14 and 15 under 35 U.S.C. 103(a) as unpatentable over the combined teachings of JP 60-148716, DE 3820811 and

EP 0964218. Claims 5, 8, and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 further in view of FR 2717126 or U.S. Patent 4,616,484 to Mehdi et. al. or U.S. Patent 2,801,827 to Dolza. The Examiner indicated that the Applicant's amendment necessitated the new grounds of rejection and therefore the Final Rejection was appropriate.

9. On September 30, 2003, the Applicant responded to the arguments presented in the Final Rejection. No additional amendments were proposed.

10. On October 6, 2003, the Examiner filed an Advisory Action and indicated that he disagreed with the Applicants analysis and conclusions.

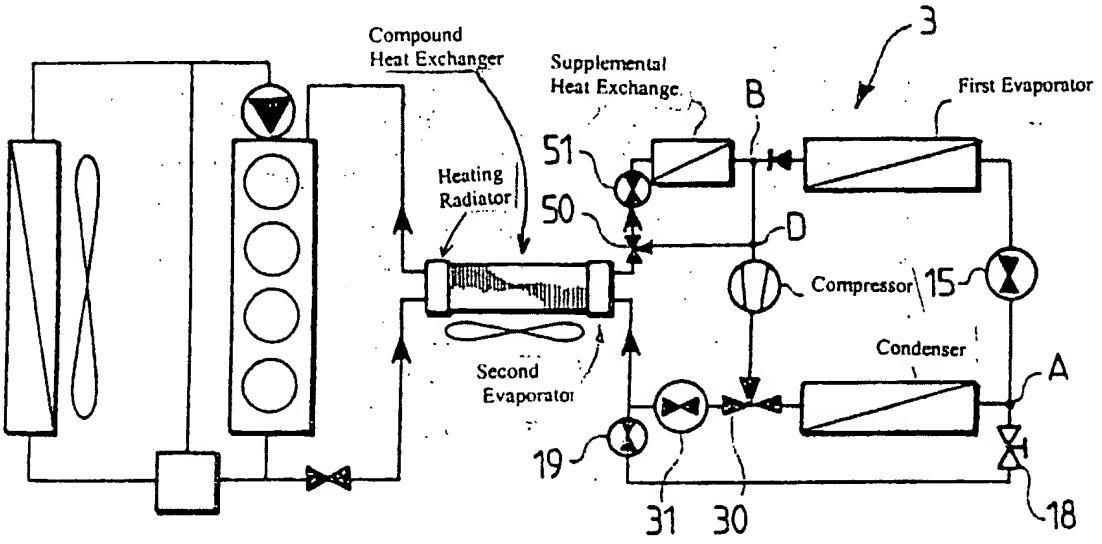
(4) STATUS OF AMENDMENT

The Office Action finally rejecting claims 1-5, 8, 9, 11, 14 and 15 was mailed on March 31, 2003. Appellant filed a Notice of Appeal on September 30, 2003 to appeal the Examiner's rejection.

Subsequently, there have been no other papers filed by the Appellant or issued by the U.S.P.T.O. However, an amendment has been submitted concurrent with this Appeal Brief to correct a typographical error. The purpose of the amendment is to avoid a 35 U.S.C. 112 second paragraph rejection and reduce issues for appeal.

(5) SUMMARY OF THE INVENTION

The elected embodiment of the present invention is a system for conditioning the air of a passenger compartment of a motor vehicle. The system is comprised of multiple components arranged in a novel fluid circuit best shown in Figure 4 of the application and in the diagram below.



The circuit is comprised of at least the following components: a compressor 13, a condenser 14 serving as a heat sink, a first evaporator 16, a second evaporator 20, and a compound heat exchanger. The invention also includes a switching means comprising multiple valves for directing refrigerant fluid flow depending on the cooling/air conditioning power required. Additionally, the invention may include a supplementary heat exchanger 52.

The first and second evaporators 16, 20, may be arranged in various configurations to perform specific tasks. For example, the first evaporator 16 may de-humidify the conditioned air and the second evaporator 20 may further cool the de-humidified air. The first 16 and second 20 evaporators may have different cooling

capacities so that fluid flow is circulated only to the first 16 or only to the second 20 evaporator depending upon the sensed cooling needs of the system. The switching means may direct the fluid alternately to only the first 16 and then only the second 20 evaporators, and then in series through both evaporators 16, 20, as the sensed cooling requirements change. Other configurations and uses are also possible. The use of multiple relatively small evaporators (rather than a single large evaporator) in combination with the claimed switching means enables the system to operate more effectively and efficiently and allows a more compact system design.

(6) ISSUES

1. Whether claims 1, 14, and 15 are patentable over the combined teachings of JP 60-148716, DE 3820811 and EP 0964218.

2. Whether claims 2-4, and 11 are patentable over the combined teachings of JP 60-148716, DE 3820811 and EP 0964218.

3. Whether claims 5, 8, and 9 are patentable over the prior art cited above as applied to claim 1, and further in view of FR 2717126 or U.S. Patent 4,616,484 to Mehdi et. al. or U.S. Patent 2,801,827 to Dolza.

(7) GROUPING OF THE CLAIMS

1. Claims 1, 14, and 15, stand and fall together.

2. Claims 2-4, and 11 stand and fall together.

3. Claims 5, 8, and 9 stand and fall together

(8) ARGUMENTS

Sub-paragraph (i)

This sub-paragraph is not applicable to the instant appeal in so far as there are no rejections under 35 U.S.C. 112, first paragraph.

Sub-paragraph (ii)

This sub-paragraph is not applicable to the instant appeal in so far as there are no rejections under 35 U.S.C. 112, second paragraph.

Sub-paragraph (iii)

This sub-paragraph is not applicable to the instant appeal in so far as there are no rejections under 35 U.S.C. 102.

Sub-paragraph (iv)

The Examiner rejected claims 1-4, 11, 14 and 15 under 35 U.S.C. 103(a) as unpatentable over the combined teachings of JP 60-148716 (JP '716), DE 3820811 (DE '811) and EP 0964218 (EP '218). Claims 5, 8, and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 further in view of FR 2717126 (FR '126) or U.S. Patent 4,616,484 to Mehdi et. al. (Mehdi) or U.S. Patent 2,801,827 to Dolza (Dolza).

Claims 1, 14, and 15

Here, the Examiner has combined three (3) prior art documents to reject claim 1. Despite this impermissible hindsight reconstruction, the prior art lacks some essential features of the claimed invention.

In his Final Rejection, the Examiner indicates that "To have plumbed the two evaporators shown in figures 1 and 5 of JP '716 in the manner shown in DE '811 to a single compressor would have been obvious to one of ordinary skill to advantageously permit humidity regulation as taught by DE '811 in regards to Figures 1-3." We clearly disagree with the Examiner.

Indeed, it may have been obvious to one of ordinary skill in the art to configure JP '716 evaporators 5a and 5b as part of two independent circuits. However, it would not have been obvious to plumb the two evaporators 5a, 5b in the manner shown in DE '811, in which the JP '716 evaporators 5a, 5b would become a part of a single unique circuit.

Significantly, the prior art fails to disclose a switching means for selectively routing fluid flow between both a first and/or second evaporator depending on the required cooling power, as specifically claimed in claim 1 of the present invention. As indicated on page 10, lines 1-10 of the DE '811 English translation, the function of the DE '811 solenoid valves 112a-112e is to switch between the heating circuit and the cooling circuit. The function of solenoid valve 112b is not to selectively stop the flow of coolant to the first evaporator 103a while letting coolant continue to flow to the second evaporator 103b, depending on the required cooling power, as indicated by the Examiner

in the March 31, 2003 Final Rejection. Consequently, even if the evaporators shown in JP '716 were re-plumbed as described in DE '811, the revised configuration would not satisfy the limitations of claim 1.

Further, JP '716 and DE '811 are complex multi-component systems. There is nothing in either patent that suggests that it would have been obvious to re-plumb the evaporators in JP '716 in the manner shown in DE '811, as suggested in the Examiner's Final Rejection. On the contrary, both systems are designed to encompass all the individual components required to allow them to function as stand-alone integrated systems. Re-plumbing a system is not modular type of modification, or one that would be obvious in combining inventions. An inventive step is clearly required to create the system disclosed in the claimed invention.

With regard to the compound heat exchanger of claims 1, 14, and 15, the Examiner points Applicant to page 6, lines 12-19 of the specification, and notes that Applicant refers to EP '218 as type of heat exchanger used in the proposed invention. Clearly, Applicant readily acknowledges that this type of heat exchanger exists. However, although basic heat exchangers such as EP '218 exists in the prior art, an individual compound heat exchanger unit, or bank of tubes with a u-shape configuration, as described in claim 15, is not used to combine refrigerant fluid with heat carrying fluid as described in the present invention, with the integral combination used to heat or cool the passenger compartment of a motor vehicle.

Further, from the provided references, it would have not been obvious to make the combination. Although JP '716 and DE '811 appear to show a heat exchanger in series with two evaporators, the reference lacks the additional limitations described in claims 14 and 15 that specifically disclose the alternating tube-type compound heat exchanger of the present invention. Further, there is no indication that the evaporators and radiator of the prior art should be combined into a single compound heat exchanger, as suggested by the invention. Although EP '218 describes, in general, a basic heat exchanger, there is no specific indication that it could be used with the other components that comprise the invention. The combination described in the invention is superior because of its increased effectiveness, efficiency, flexibility and more compact design. Nothing in the prior art specifically suggests this combination, particularly with this level of detail, and with these specific limitations.

The Examiner's assertion that it would be obvious to modify JP '716 in view of DE '811, which would be obviously further modified in view of EP '218, is incorrect. The Examiner's assumption of obviousness is particularly dubious since the references (except EP '218) comprise fully integrated systems, and not individual components. To modify these references to achieve the limitations of the present invention would clearly result from hindsight reconstruction, which is not permitted. MPEP 2143.01 specifically states that even if the references can be combined (which is questionable in this case), that fact alone does not render the resultant combination obvious unless the references suggest the desirability of the combination, citing *In Re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The examiner may not, because of doubt that the invention is

patentable, resort to unfounded assumption or hindsight reconstruction to supply deficiencies in the factual basis for the rejection. See In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173,178 (CCPA 1967). There is no suggestion to support the Examiner's assertion that it would be obvious to combine these references.

Claims 2-4 and 11

Neither JP '716 nor DE '811 discloses a switching means capable of creating the fluid circuits and evaporator configurations claimed in claims 2-4 and 11. The prior art does not disclose a switching means in a refrigerant fluid circuit capable of making refrigerant flow first in only one evaporator of a two evaporator system, then alternately first in one evaporator and then in another, as claimed in claims 2 and 3. The prior art also does not disclose a two evaporator system wherein the two evaporators have different cold-production capacities or are linked in a parallel arrangement, as claimed in claims 4 and 11. Further, based on JP '716 and DE '811, it would not be obvious to create the claimed switching means.

Claims 5, 8, and 9

To reject claims 5, 8, and 9, the Examiner suggests further modifying the fluid circuit disclosed in DE '811, as combined with JP '716 and EP '218, to include the control circuits disclosed in FR '126, Mehndi, or Dolza. While some aspects of the control circuits exist in the references, they do not exist in combination with the specific compound heat exchanger disclosed in the invention, and in the configuration described in the invention. There is no suggestion of using the control systems in a fluid circuit

comprised of a single component compound heat exchanger having two chambers, the first chamber being filled with refrigerant fluid and the second chamber being filled with heat carrying fluid. Further, there is no suggestion in any of the references that the reference systems can be combined with a system specifically configured as suggested in the application.

Sub-paragraph (v)

This paragraph is not applicable to the instant appeal in so far as the final rejection does to raise any issues other than those referred to in sub-paragraphs (i)-(iv).

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance, and notice to that effect is earnestly solicited. Appellant will request an oral hearing on the merits within two months after the date of the Examiner's answer.

Respectfully submitted,

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Title: VEHICLE AIR CONDITIONING DEVICE INCLUDING A MULTIPURPOSE HEAT EXCHANGER

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(9) APPENDIX OF CLAIMS ON APPEAL

1. (Previously amended) A device for air-conditioning a passenger compartment of a motor vehicle, comprising:

a refrigerant-fluid circuit including a compressor, a condenser serving as a heat sink and a first evaporator serving as a cold source, the device further including a heating radiator and a second evaporator and switching means for selectively routing fluid flow between one of and both the first and second evaporators depending on a required cooling power, the first and second evaporators being traversed one after the other at least partly by an airflow to be cooled; wherein said heating radiator and said second evaporator form a compound heat exchanger comprising two fluid chambers arranged on either side of a bank of tubes.

2. (Original) The device of Claim 1, in which the switching means are able, moreover, to make the fluid flow only in the second evaporator.

3. (Original) The device of Claim 2, in which the switching means are able to make the fluid flow alternately in the first and second evaporators.

4. (Original) The device of Claim 2, in which the first and second evaporators have different cold-production capacities.

5. (Original) The device of claim 1, in which the switching means include means for making the fluid flow in an additional heating loop containing the second evaporator and not containing the condenser nor the first evaporator, the second evaporator then serving as heat source.

6. (Withdrawn) The device of claim 5, in which the additional heating loop contains, between the outlet of the second evaporator and the inlet of the condenser, a pressure-reducing valve in parallel with bypass means which can be closed off, allowing the fluid to pass through this pressure-reducing valve when the second evaporator is serving as heat source and to avoid it when the second evaporator is serving as cold source.

7. (Withdrawn) The device of Claim 5, in which the said circuit includes a unit module linked to the inlet of the compressor, to the outlet of the condenser, to the inlet and to the outlet of the first evaporator, to an external junction point situated between the outlet of

the compressor and the inlet of the second evaporator and to the outlet of the latter, the said module containing at least one anti-return valve arranged between the outlet of the first evaporator and the inlet of the compressor, an internal junction point linked to the outlet of the condenser, a first pressure-reducing valve interposed between the internal junction point and the inlet of the first evaporator, and a stop valve and a second pressure-reducing valve which are interposed between the internal junction point and the inlet of the second evaporator.

8. (Original) The device of Claim 5, in which the additional heating loop further contains, between the second evaporator and the compressor, a pressure-reducing valve followed by a supplementary heat exchanger able to extract heat from an outside environment, and operates as heat pump.

9. (Original) The device of Claim 8, in which means are provided for allowing the fluid to circumvent the supplementary heat exchanger and the associated pressure-reducing valve when it is flowing in the two evaporators.

10. (Withdrawn) The device of Claim 1, in which the switching means are able to make the fluid leaving the compressor flow first of all in the second evaporator, which then plays the role of condenser, then in two branches, in parallel, respectively containing the first evaporator and the condenser, which then plays the role of evaporator, before bringing it back to the compressor.

11. (Original) The device of Claim 1, in which the two evaporators, as cold sources, are

arranged mutually in parallel in the circuit.

12. (Withdrawn) The device of Claim 1, in which the two evaporators, as cold sources, are arranged mutually in series in the circuit.

13. (Withdrawn) The device of Claim 12, in which the circuit further includes means for setting the throughput and/or the pressure of the fluid sent into the evaporators as a function of the pressure and/or of the temperature of the fluid leaving one and/or the other of the evaporators.

14. (Original) The device of Claim 1, in which one of the first and second evaporators forms, with a radiator for heating the passenger compartment, a compound heat exchanger in which an airflow to be cooled or to be heated is in thermal contact both with the refrigerant fluid of the said circuit and with a heat-carrying fluid supplying the said radiator.

15. (Original) The device of Claim 14, in which the said compound heat exchanger comprises two fluid chambers supplied respectively with refrigerant fluid and with heat-carrying fluid, which are arranged at opposite ends to one another with respect to a bank of tubes, each tube having a U-shaped configuration in which the ends of the two branches communicate with one of the fluid chambers, in such a way as to be traversed by the corresponding fluid, this fluid being alternately the refrigerant fluid and the heat-carrying fluid in the direction of the airflow.

16. (Withdrawn) The device of Claim 1, in which one of the first and second evaporators forms, with a first heat exchanger in which a heat-carrying fluid flows, a compound heat exchanger in which the said refrigerant fluid exchanges heat with the said heat-carrying fluid, the latter also flowing in a second heat exchanger intended to heat or to cool a region of the passenger compartment other than that receiving the said airflow, and/or in a reservoir allowing storage of heat or of cold.

17. (Withdrawn) The device of Claim 1, in which the first evaporator, a radiator for heating the passenger compartment and the second evaporator are traversed successively in that order by an airflow to be cooled or to be heated.

18. (Withdrawn) A device for air-conditioning a passenger compartment of a motor vehicle having a refrigerant fluid circuit comprising:

a heating radiator;

a compressor,

a condenser serving as a heat sink;

a first evaporator serving as a cold source,

a second evaporator; and

a switching mechanism disposed to selectively route fluid flow between one of and both the first and second evaporators depending on a required cooling power; wherein said heating radiator and said second evaporator form a compound heat exchanger comprising two fluid chambers arranged on either side of a bank of tubes.

19. (Withdrawn) The device according to claim 18, wherein said switching mechanism is disposed and adapted to route fluid flow solely between one of said first evaporator only and through both said first and second evaporators.

20. (Withdrawn) The device according to claim 1, wherein said switching means is disposed and adapted to route fluid flow solely between one of said first evaporator only and through both said first and second evaporators.